REMARKS

Applicants thank the Examiner for the very thorough consideration given the present application. Claims 2, 4-19, 21, and 23 are now present in this application, of which claims 2, 4, 21, and 23 are independent. By this amendment, claims 2 and 23 have been amended. Reconsideration of this application, as amended, is respectfully requested.

Reasons for Entry of Amendments

At the outset, it is respectfully requested that this Amendment be entered into the Official File in view of the fact that the amendments to the claims automatically place the application in condition for allowance.

In the alternative, if the Examiner does not agree that this application is in condition for allowance, it is respectfully requested that this Amendment be entered for the purpose of appeal. This Amendment reduces the issues on appeal by removing the objection to claims 19 and 23

Claim Objections

The Examiner has objected to claims 19 and 23 because of several informalities. In order to overcome this objection, Applicants have amended claims 19 and 23 in order to correct the deficiencies pointed out by the Examiner. Reconsideration and withdrawal of this objection are respectfully requested.

Rejections under 35 U.S.C. §103

Claims 2, 5, and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Reynolds in view of Farnworth, and further in view of Bartschat; claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Reynolds, Farnworth, Bartschat, and in further view of Gilmore; claim 19 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Reynolds, Farnworth, Bartschat, and in further view of Roy; claims 7, 8, 10, 12, and 14-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Reynolds, Farnworth, Bartschat, and in further view of Ham; claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over

Reynolds, Farnworth, Bartschat, and Ham, and in further view of Neo. These rejections are respectfully traversed.

Complete discussions of the Examiner's rejections are set forth in the Office Action, and are not being repeated here.

Applicants respectfully submit that independent claim 2 recites a combination of elements in an electronic device test apparatus for testing DUTs by pushing their input/output terminals against contact units of a test head including "a moving device configured to pick up and move the DUTs", "a first imaging device configured to capture an image of a front surface of the DUT on which the input/output terminals are led out before being picked up by the moving device", "a second imaging device configured to capture an image of a back surface of the DUT on which the input/output terminals are not led out after being picked up by the moving device", and "a calculating device configured to calculate the position and posture of the outside shape of the front surface of the DUT before being picked up by the moving device and the position and posture of the input/output terminals of the DUT before being picked up by the moving device from image information captured by the first imaging device, calculate the position and posture of the outside shape of the back surface of the DUT after being picked up by the moving device from image information captured by the second imaging device, and calculate the position and posture of the input/output terminals of the DUT after being picked up by the moving device based on the results of these calculations."

Similarly, Applicants respectfully submit that independent claim 21 recites a combination of steps in a method of testing DUTs pushing their input/output terminals against contact units of a test head including "capturing a first image of a front surface of a DUT on which the input/output terminals are led out before the DUT is picked up by a moving device configured to pick up and move DUTs", "capturing a second image of a back surface of a DUT on which the input/output terminals are not led out after being picked up by the moving device", and "calculating the position and posture of the outside shape of the front surface of the DUT before being picked up by the moving device and the position and posture of the input/output terminals of the DUT before being picked up by the moving device from the first image", calculating the position and posture of the outside shape of the back surface of the DUT after being picked up by

the moving device from the second image", and "calculating the position and posture of the input/output terminals of the DUT after being picked up by the moving device based on the results of these calculations."

Applicants respectfully submit that the combinations of elements or steps as set forth in independent claims 2 and 21 are not disclosed or made obvious by the prior art of record, including Reynolds, Farnworth, and Bartschat.

Reynolds

The Examiner asserts that the Reynolds discloses a calculating device configured to calculate the position (X,Y) and posture (angle) of the DUT (26) picked up by the moving device (10) from the image information captured by the first imaging device (50) and the second imaging device (52).

However, Applicants respectfully submit that Reynolds describes that a bond sensor (54) is for sensing the X, Y and θ coordinates of a substrate (40) at the bonding place, the die sensor (52) is for sensing X, Y and θ coordinates of the die (26) on a die transport (10,24), and a controller correlates the sensed coordinates from the bond and die sensor (54,52) and adjusts the X, Y and θ of the die (202) and the substrate (40) relative to each other. *See* col. 3, lines 4-14 and col. 5, lines 52-55. Therefore, the wafer camera (50) is not utilized for sensing the position of the die (26) on the die transport (10).

Accordingly Reynolds does not disclose that a calculating device calculates the position of the DUT (202) picked up by the moving device (10) from the image information captured by the first imaging device (50).

Farnworth

In addition, the Examiner asserts that the Farnworth discloses: (i) a calculating device calculates the position and posture of the outside shape of the one surface of the DUT before being picked up by the moving device from image information captured by the first imaging device; (ii) the calculating device calculates the position and posture of the input/output terminals of the DUT before being picked up by the moving device from image information captured by the first imaging

device; (iii) the calculating device calculates the position and posture of the outside shape of the other surface of the DUT after being picked up by the moving device from image information captured by the second imaging device; and (iv) the calculating device calculates the position and posture of the input/output terminals of the DUT after being picked up by the moving device based on the results of these calculations.

Applicants respectfully disagree with the Examiner's assertion. In particular, features (ii), (iii) and (iv) are not disclosed in Farnworth

Regarding feature (ii), the Examiner does not specifically identify where this feature is disclosed in Farnworth Specifically, there is no description on the position of the input/output terminals of the DUT in col. 10, lines 9-24 of Farnworth. Accordingly, the above-mentioned feature (ii) is not disclosed in the Farnworth

Regarding feature (iii), in Farnworth, the calculating device does not calculate the position of the outside of the other surface of DUT and does not calculate the position of the outside of same surface of DUT as the surface in the above-mentioned feature (i).

In Farnworth, the first camera (24) takes a picture of the DUT (202) inverted by die inverter 16 (col. 9, lines 45-46, and 55-61), then the primary gripper (52) picks up the DUT (202) (col. 18, lines 44-50) and moves the DUT (202) above the second camera (30) (col. 11, lines 22-24 and col. 18, lines 51-52), then the second camera (30) takes a picture of the DUT (202) (col. 11, lines 31-35), and then the primary gripper (52) aligns the DUT (202) and temporary package base and presses the two together (col. 14, lines 23-27 and col.18, lines 60-63).

Therefore, there is no inversion of the DUT (202) between the shooting by the first camera (24) and the shooting by the second camera (30). Also the first camera (24) captures the DUT (202) from the downside (Fig 3B and col. 9, lines 55-61), and the second camera (30) captures the DUT (202) from the downside as well (col. 11, lines 24-27 of Farnworth). Therefore the first camera (24) and the second camera (30) take a picture of the same surface of the DUT (202).

Furthermore, the input/output terminals (204) of the DUT (202) picked up by the primary gripper (52) are directed downward and the primary gripper (52) picks up the back surface (on which the input/output terminals (204) are not led out) of the DUT (202), because the input/output terminals (204) of the DUT (202) and the contact (314) of the package base (302) mounted on the

insert (316) contact by pressing of the primary gripper (52) (Fig. 15, col. 16 lines 49-51, col. 17 lines 5-8 and col.18 lines 60-63). Therefore the first camera (24) and the second camera (30) take a picture of the same front surface (on which the input/output terminals are led out) of the DUT (202).

Accordingly the above-mentioned feature (iii) is not disclosed in the Farnworth patent.

Finally, regarding above-mentioned feature (iv), in order to determine a fine position of DUT (202), multiple pictures captured by the second camera (30) are utilized and no picture captured by the first camera (24) is utilized (col. 11 lines 31-67). Farnworth fails to describe that the position of the input/output terminals of the DUT (202) after being picked up by the primary gripper (52) is calculated on the basis of the results of the above-mentioned (i)-(iii) in the Farnworth patent.

Moreover, because the second camera (30) can directly take a picture the input/output terminals of the DUT (202) and the position of the DUT (202) picked up by the primary gripper (52) is able to be calculated on the basis of the picture captured by the second camera (30), there is no need for Farnworth to provide the feature of above-mentioned feature (iv).

Accordingly the above-mentioned (iv) is not disclosed in the Farnworth patent.

Bartschat

The Examiner asserts the Bartschat discloses: (i) a first imaging device (40) configured to capture an image of a front surface of the DUT (16) on which the input/output terminals (14) are led out before being picked up by the moving device (22); and (ii) a second imaging device (38) configured to capture an image of a back surface (surface where no terminals are exposed) of the DUT (16) on which the input/output terminals (14) are not led out after being picked up by the moving device (22).

Applicants respectfully submit that at least the above-mentioned feature (ii) is not disclosed in Bartschat. Particularly, the second imaging device (38) is utilized to observe the image of the upper surface of the particular substrate (11) placed in the chuck (32) (col. 3, lines 52-54). Furthermore, Bartschat fails to disclose that the second imaging device (38) captures an image of the DUT (16). Accordingly the above mentioned (ii) is not disclosed in the Bartschat.

Accordingly, even if one of ordinary skill in the art were to combine Reynolds, Farnworth, and Bartschat as suggested, the hypothetical combination would fail to teach all featured of independent claims 2 and 21.

Under conventional approaches, when the DUT is to be positioned for testing, the position of the input/output terminals of the DUT picked up by the moving device (not the position of the outside shape of the DUT picked up by the moving device) is required. However, when the moving device picks up the front surface (on which the input/output terminals are led out) of the DUT, an imaging device cannot directly capture the front surface and the position of the input/output terminals of the DUT, because the moving device hides the front surface from the view of the imaging device. As a result, it is difficult to determine the position and posture of the input/output terminals on the front surface.

In contrast, as a result of the present invention, even if the moving device hides the front surface, it is possible to determine the position and posture of the hidden input/output terminals of the DUT and achieve high precision positioning of the DUT. Reynolds, Farnworth, and Bartschat fail to teach or suggest the claimed inventions set forth in independent claims 2 and 21.

Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

With regard to dependent claims 5-12, 14-16, and 19, Applicants submit that claims 5-12, 14-16, and 19 depend, either directly or indirectly, from independent claim 2, which is allowable for the reasons set forth above, and therefore claims 5-12, 14-16, and 19 are allowable based on their dependence from claim 2, as well as for their additionally recited subject matter. Reconsideration and allowance thereof are respectfully requested.

Allowable Subject Matter

The Examiner states that claims 4 and 23 are allowed, and claims 13, 17, and 18 would be allowable if rewritten in independent form.

Applicants thank the Examiner for the early indication of allowable subject matter in this application. However, claims 13, 17, and 18 have not been rewritten in independent form at this time, since it is believed that independent claim 2, from which these claims depend, is allowable.

Additional Cited References

Since the remaining references cited by the Examiner have not been utilized to reject the claims, but have merely been cited to show the state of the art, no comment need be made with respect thereto.

CONCLUSION

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance.

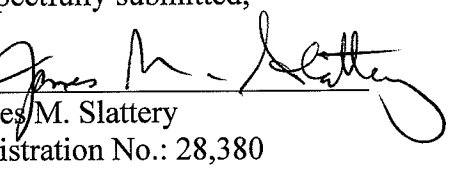
If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Chad D. Wells., Registration No. 50,875, at (703) 205-8000, in the Washington, D.C. area.

Prompt and favorable consideration of this Amendment is respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Dated: November 4, 2008

Respectfully submitted,

By 
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